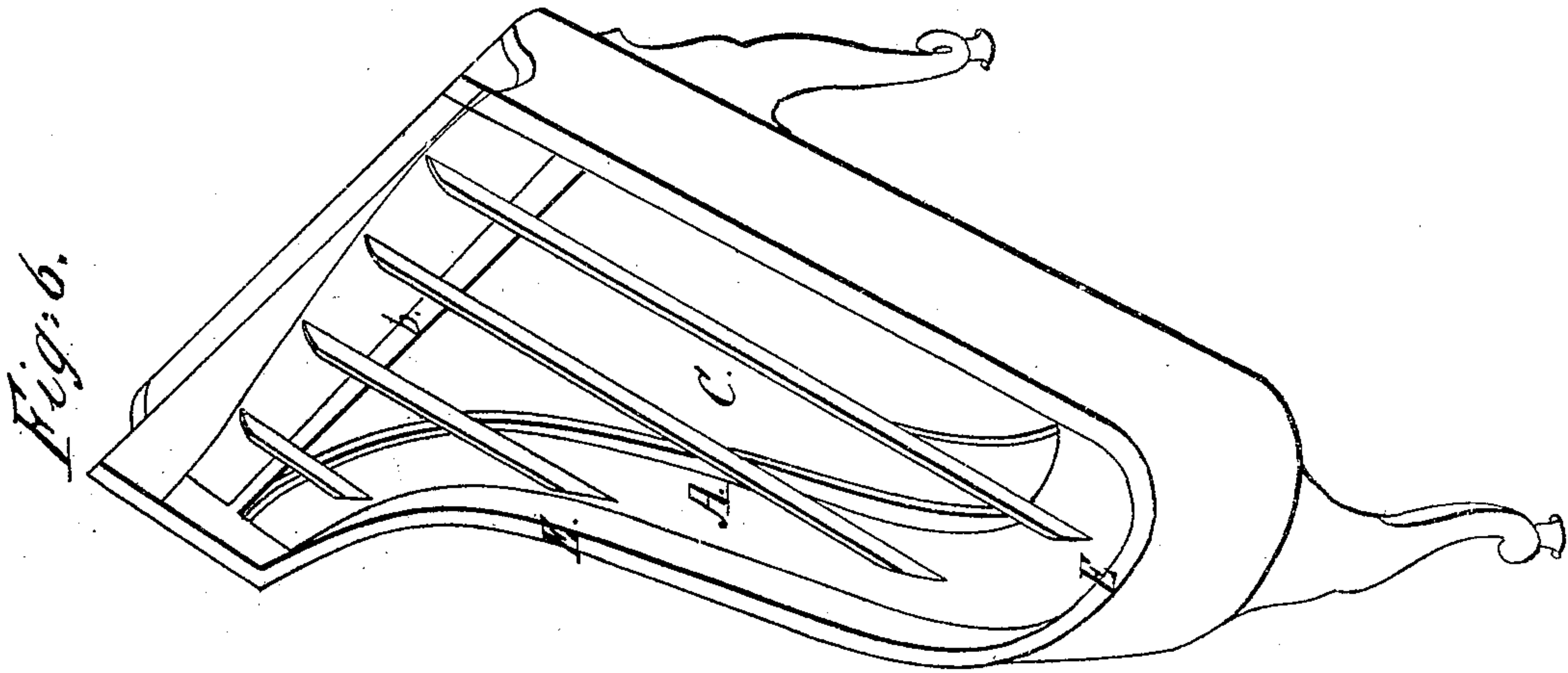
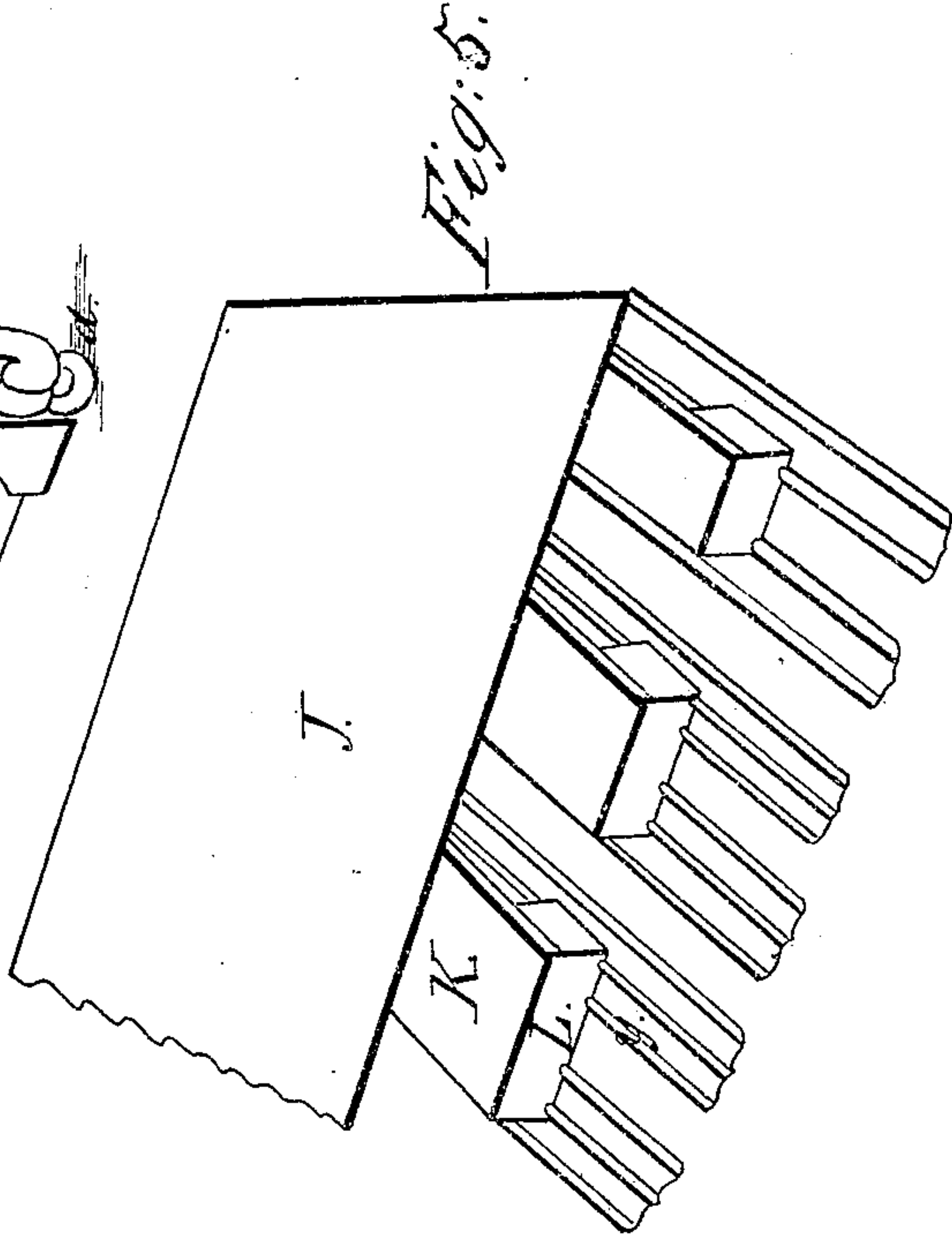
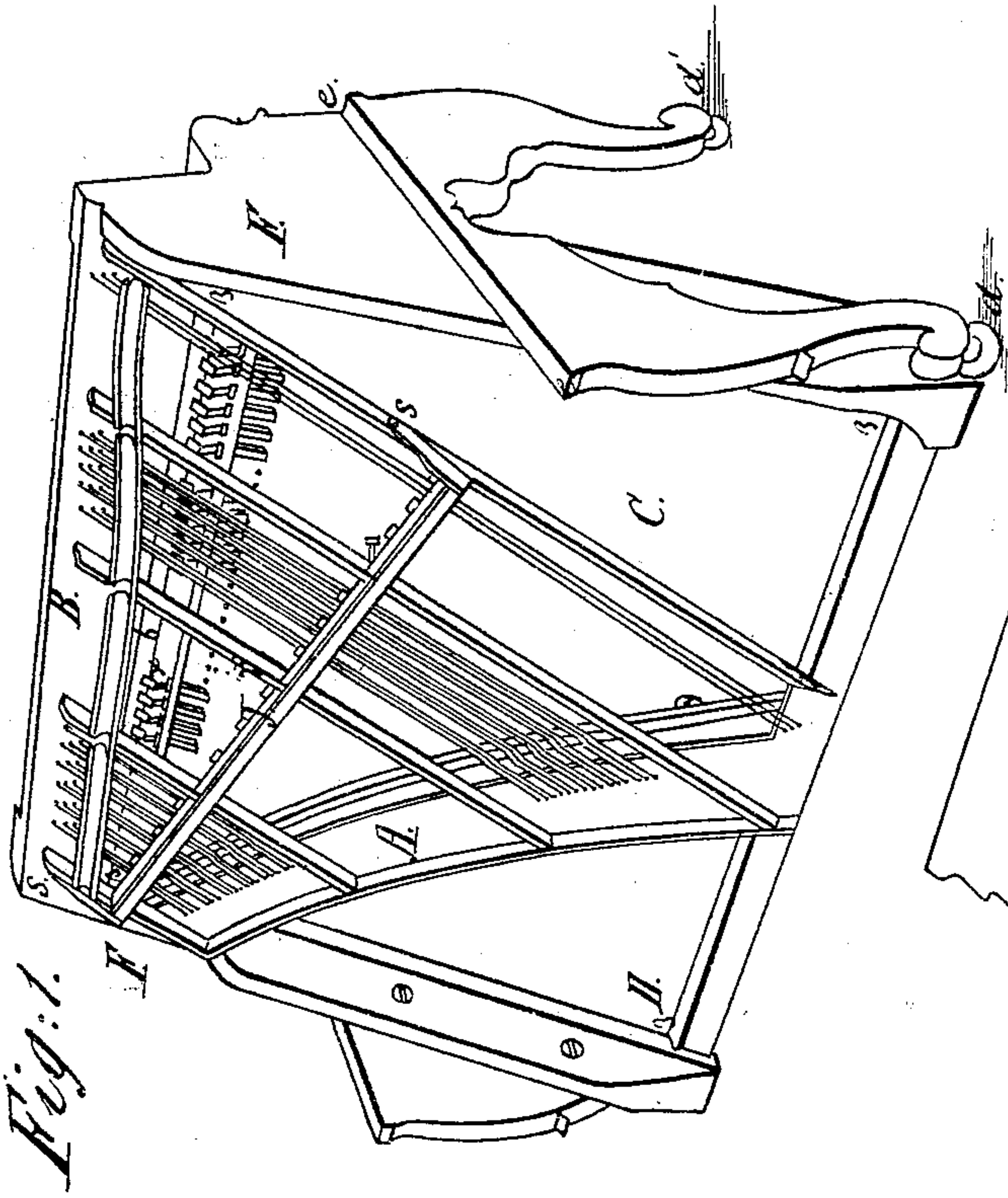


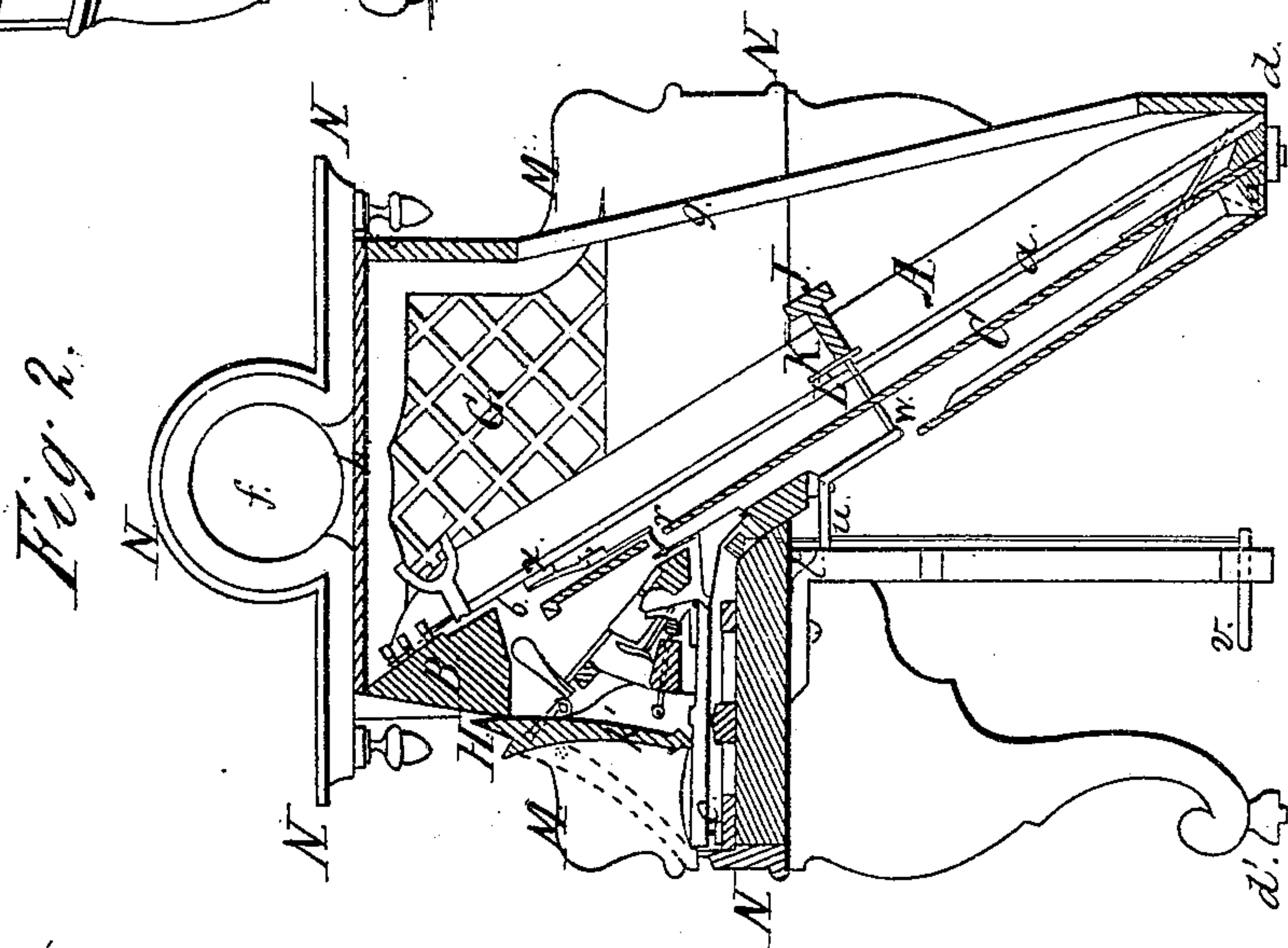
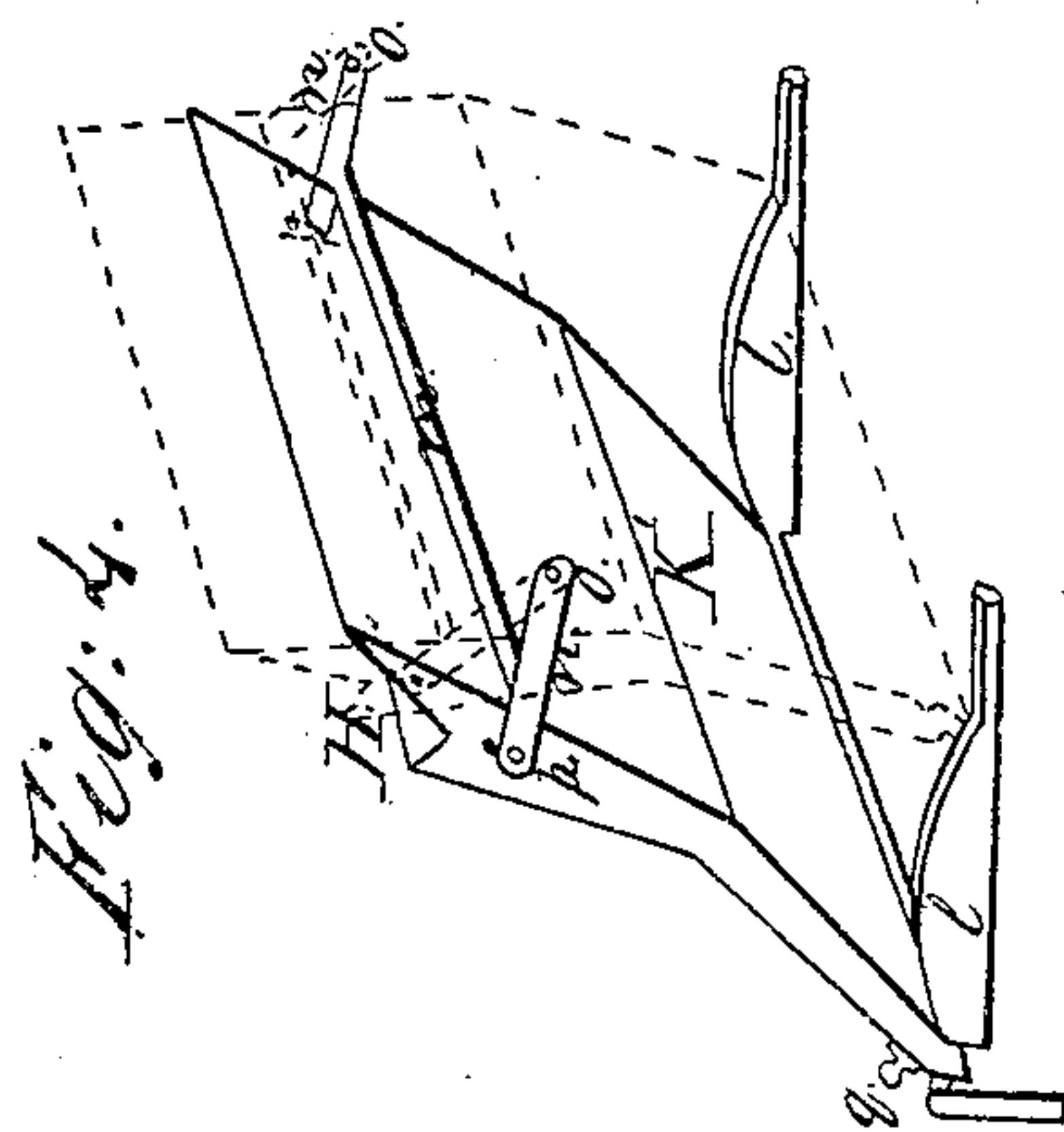
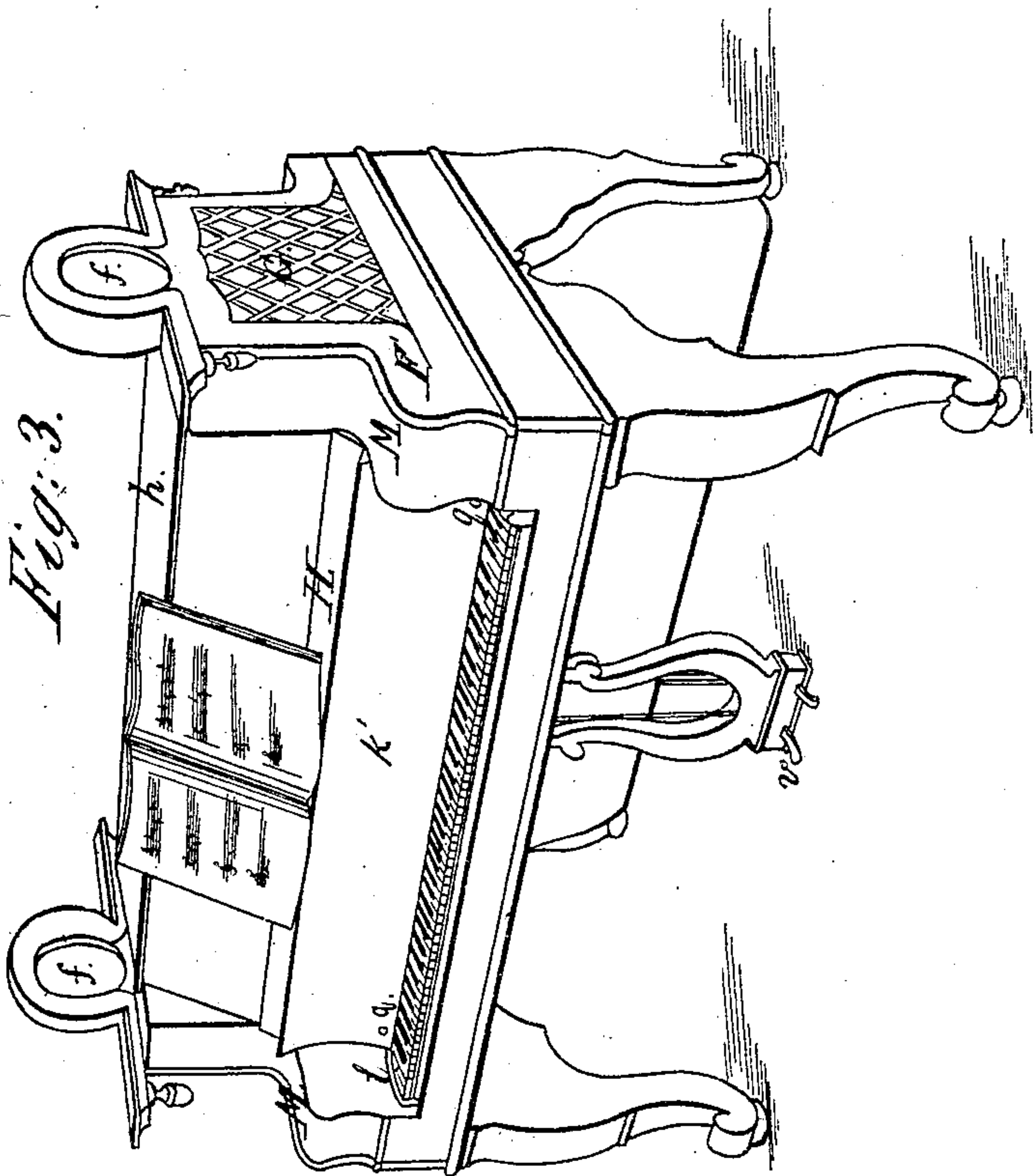
J. W. Otto,
Piano fortes,
No 57,558, Patented Aug. 28, 1866.



Witnesses.
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George Schuend.

Inventor.
John William Otto.

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UNITED STATES PATENT OFFICE.

JOHN W. OTTO, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN PIANOS.

Specification forming part of Letters Patent No. 57,558, dated August 28, 1866.

To all whom it may concern:

Be it known that I, JOHN WILLIAM OTTO, of St. Louis, in the county of St. Louis and State of Missouri, have invented new and useful Improvements on the Piano-Forte; and I do hereby declare that the following is a clear and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figures 1 and 3 are perspective views. Fig. 2 is a transverse section; and Figs. 4 and 5 are perspective views of details. Fig. 6 represents a perspective view of the ordinary grand piano.

I designate and name the piano with my improvements the "American Piano."

The object of my improvements is increase of sound, reduction of weight and length of the ordinary grand piano, convenient dimensions, durability, a pleasing form, and cheapness of manufacture.

In the construction of my improvements on the piano-forte, I adopt, as far as the relation of the iron frame, wrest-plank, plane of stringing, hammer-passage, and sound-board to each other is concerned, that of the ordinary grand piano; but I change their position from a horizontal to an inclined plane, elevate the wrest-plank, and change the form of the sound-board and case into a parallelogram, the rear part of which rests near the floor on casters, while the key-board retains its position, as represented in the accompanying drawings, where, in Figs. 1 and 2, A shows the iron frame; B, the wrest-plank; *a* and the blue lines, the plane of stringing; *b*, the hammer-passage, and C the sound-board. *c*, Fig. 2, represents the position of the keys. By reducing the distance between the back end *d* and the front *d'* through this inclined position, and by elevating the wrest-plank higher above the key-board, or, which is the same thing, by increasing the angle of inclination *x* to about fifty to sixty degrees, the horizontal distance from the front to rear of my instrument is contracted to about three to three and a half feet, while its height, by elevating the wrest-plank about one foot above the key-board, is increased to about four to four and a half feet.

I have widened the case at the back end, D, to form exactly or nearly a rectangle, B

B B B, Fig. 1, in order to do away with the curved sides of the grand piano, Fig. 6, E E, to facilitate manufacture, and to enlarge the sound-board. Owing to its diagonal position in the transverse section of the piano, Fig. 2, C, the sound-board of my improved piano occupies, comparatively to the size of the whole instrument, a larger area than that of any other piano known to me, and therefore (if well constructed mechanically and according to the laws of acoustics) offers the most accommodating conditions for transmitting the sound of the strings. The strings are put obliquely to the wrest-plank, in order to allow their vibrating lengths to be made nearly the same as on the grand piano.

The removable end casings.—Fig. 1 represents the rear of the piano when stripped of its end casings, top, and back casing. The ends, Fig. 1, F F, are cased with a frame, the apertures or open panels G, Figs. 2 and 3, of which may be filled with taffeta, wire-cloth, filigree-work, and such like.

Fig. 2, N N N N N, represents a vertical projection, and Fig. 3, F', a perspective view of the end casings. These casings are not glued on the case, but arranged so as to be taken off at pleasure. They can easily be detached and replaced without injury, in a usual manner, by means of screws, hooks and eyes, buttons, or otherwise. They may be sustained by the legs projecting about the thickness of the casings, Fig. 1, *e e*.

The object of these removable end casings is, first, to facilitate removing the piano through narrow passages by diminishing its weight and size, as also at the same time rendering it less liable to damage; second, to facilitate manufacturing, as these frames may be made and finished separately from the piano, are easy to handle, and will dispense with many contrivances hitherto used for gluing on the outside covering and veneering, thereby saving much labor and cost; third, to have the sound of the piano pass through the panels G; fourth, to obtain a symmetrical and pleasing form.

The circular opening *f* on top is for placing a metronome, bust, clock, or some other artistic or useful ornament, which, however, relates rather to the embellishment than the essential qualities.

The back casing.—The back casing in the

transverse section, Fig. 2, *g*, of the piano consists of a frame with panels or apertures, covering the whole rear, and is arranged similar to that of the end casings, and for the same purpose, and is also removable, together with the top *h*, which is joined to it by hinges at *i*, Fig. 2. The piano-legs may be taken off, also, in a usual manner.

The key-lid.—Fig. 4 represents a perspective view of its rear. I have arranged the key-lid *k'*, Figs. 2, 3, and 4, in such a manner that its front always remains visible, whether the key-board be closed or not. It is fastened on a peculiar kind of joint and slides over blocks *l l*, Fig. 4. This joint or hinge consists of the rod *m*, with cross-pieces *n n* firmly connected on each end. The back ends of these cross-pieces are fastened and can turn on a center pin or joint, *o*, on the head-boards of the action, while the front ends, *p*, are fastened in the same manner on the ends of the lid. By means of pulling or pushing buttons *q q*, Figs. 3 and 4, in front of the lid, it may be moved and slid over the convex surfaces of the blocks *l l*, so that the key-board may be covered and uncovered. The full lines, Fig. 4, show the rear of the key-lid and joint when the key-board is closed. The dotted red lines show the same when the keys are uncovered. The edge *H*, Figs. 3 and 4, is adapted to hold the music-sheets leaning a little backward against the top of the piano, thereby gaining a substantial device for holding the music, and also saving the work of making an extra music-desk and of finishing both sides of the lid.

The damper-passages.—The characteristic feature for the damper movement is the apertures *r*, Figs. 1 and 2, in the sound-board, serving as passages for transmitting the movement of the keys *c* to the dampers *x*.

The soft pedal.—Underneath the rail *J*, across and above the strings, with a cross-piece at each end, turning on the center pins *S S*, Fig. 1, small slips of india-rubber or some other very elastic material, *K*, Fig. 5, fastened on a little piece of soft felt, *L*, are attached, so as to project a little.

Fig. 5 shows the natural size of the slips *K* and felt pieces *L* and their bearing on the strings *y*. In order to weaken or soften the sound, the rail *J*, with the felted slips, will bear on one or two strings of each note only, thereby stopping their sound, but leaving the untouched strings free to vibrate.

Owing to its elastic nature, the projecting parts *K* of the india rubber will act as springs and effect an equal bearing upon all their corresponding strings.

The felt pieces, when not employed, are about half an inch above the plane of stringing, and kept at that distance by means of a spring, *t*, Fig. 2, fastened on the bottom of the piano and pressing against the end *u* of a double lever so much or more as to counterbalance the weight of the rail *J*, which presses, by

means of a prop, *w*, on the other end of the lever.

As soon as the use of the soft pedal is required, the pedal-foot *v*, raising rod and lever-arm *u*, will lower lever-arm *w*, together with the rail *J*, so far down as to give the felt pieces *L* a sufficient bearing upon the strings to stop their sound; then the movement is checked in a usual manner by some other rest for the rail *J* to bear upon. After releasing the pedal-foot *v* the whole soft-pedal arrangement will resume its primary position, as in Fig. 2.

The object of this arrangement is effectiveness, durability, easiness of construction and of keeping in order. Being above the strings, it can, in case of necessity, be reached and handled conveniently.

The set-offs.—The set-offs *M M*, Fig. 3, on each side of the key-board in the outlines of the case, and originating in constructive reasons, are to serve as lamp-holders.

I wish to remark that in the American piano the action and damper movement may be constructed without difficulty on principles of known actions and dampers.

I do not intend to claim, broadly, as my invention, although originated by myself, an inclined sound-board or stringing, supposing that such is not patentable nor new.

What I now claim as my improvements on the piano-forte in general, as also on the grand piano in particular, and for which I desire to secure Letters Patent, is—

1. The particular manner in which the case of the piano (including wrest-plank, iron frame, plane of stringing, and sound-board) is inclined, contracted, elevated, and the area of the sound-board enlarged, for the purpose of attaining convenient dimensions, a more effective sound-board, and other improvements resulting from this transformation, and claimed herein separately, substantially as described.
2. The removable end casings *F F*, as described, and for the purposes specified.
3. The removable back casing *g*, as described, and for the purposes set forth.
4. The key-lid *k*, its joints *n n*, and their connecting-rod *m*, arranged as described, and for the purposes specified.
5. Apertures *r* in the sound-board, serving as passages through which the damper movement is transmitted, as set forth.
6. The soft-pedal arrangement by means of a jointed rail, *J*, and india-rubber slips *K*, or its equivalent, substantially in the manner and for the purposes set forth.
7. Set-offs *M M* on each side of the key-board, in the manner set forth and for the purpose specified.

JOHN WILLIAM OTTO.

Witnesses:

HENRY TORRET,
GEO. SCHUDERER.